CLAIMS

We claim:

1   1.   A method comprising:

2   allocating a first portion of a first memory as a static section to store a main

3   program which uses functional programs stored in a second memory;

4   allocating a second portion of the first memory as a dynamic section to store other

5   programs, the dynamic section including an overlay space to overlay the functional

6   programs loaded from the second memory to conserve memory capacity of the first

7   memory; and

8   allocating a third portion of the first memory as a prelude space to store preludes

9   which provide resource identifiers to identify the functional programs to be loaded into

10   the overlay space, so that when the main program is to perform a functional operation

11   without identifying a particular functional program stored in the second memory, a

12   corresponding prelude in the prelude space for the functional operation provides a

13   corresponding resource identifier to load a corresponding functional program into the

14   overlay space.

1   2.   The method of claim 1, wherein the allocating of the prelude space allocates the

2   prelude space in the static section of the first memory.

1   3.   The method of claim 1, wherein the allocating of the prelude space allocates the

2   prelude space in the dynamic section of the first memory.

1   4.   The method of claim 1, wherein the allocating of the dynamic section allocates

2   the overlay space with a fixed entry address so that the preludes need not assign an

3   address for loading the functional programs.

1   5.   The method of claim 1, wherein the allocating of the first, second and third

2   portions are allocated on the first memory resident on an integrated circuit and the

3   functional programs to be loaded into the overlay space are resident on the second

4   memory external to the integrated circuit.

1   6.   A method comprising:

2   executing a program statement of a main program to perform a particular

3   functional operation without identifying a corresponding functional program;

4   executing a prelude stored in a prelude space of a memory to provide a resource

5   identifier for the functional operation;

6   using the resource identifier to identify a corresponding functional program to

7   perform the particular functional operation;

8   loading the functional program into an overlay space allocated in the memory;

9   and

10   executing the functional program in the overlay space.

1   7.   The method of claim 6, wherein the loading the functional program into the

2   overlay space loads the functional program into a fixed entry address so that an address to

3   load the functional program need not be specified in the prelude.

1   8.   The method of claim 7, wherein executing the prelude loads the resource

2   identifier into a register and transfers execution to a routine to call the functional

3   program.

1   9.   The method of claim 8, wherein using the resource identifier includes reading the

2   resource identifier in the register by the routine to call the functional program.

1   10.   The method of claim 9, further comprising returning to the main program after

2   executing the functional program in the overlay space.

1   11.   The method of claim 9, wherein executing the functional program executes a

2   statement requiring at least one other functional program to be loaded into the overlay

3   space and in which nested calling of functional programs are achieved by loading

4   multiple functional programs into the overlay space.

1   12.   An apparatus comprising:

2   a first memory having a first portion as a static section to store a main program

3   which uses functional programs, a second portion as a dynamic section to store other

4   programs which reside in the first memory for a shorter duration than the main program,

5   and a prelude space to store preludes which provide resource identifiers to identify the

6   functional programs to be loaded into an overlay space located within the dynamic

7   section; and

8   a second memory operably coupled to store the functional programs and to

9   transfer a particular functional program into the overlay space when the main program

10   performs a functional operation without identifying the particular functional program

11 stored in the second memory, but in which a corresponding prelude in the prelude space

12 for the functional operation provides a corresponding resource identifier to identify the

13 particular functional program to be loaded into the overlay space.

1   13.   The apparatus of claim 12, wherein the first memory is a random access memory

2   resident in an integrated circuit and the second memory is an external memory to the

3   integrated circuit.

1   14.   The apparatus of claim 13, wherein the second memory is larger in capacity than

2   the first memory, but in which the functional programs are loaded into the overlay space

3   to allow overlay in use of the functional programs.

1   15.   The apparatus of claim 14, wherein the overlay space has a fixed entry address so

2   that an address to load functional programs need not be specified in the preludes.

1   16.   A multi-function handheld device comprising:

2   a system on a chip integrated circuit that includes an internal memory arranged to

3   have a first portion as a static section to store a main program which uses functional

4   programs, a second portion as a dynamic section to store other programs which reside in

5   the internal memory for a shorter duration than the main program, and a prelude space to

6   store preludes which provide resource identifiers to identify the functional programs to be

7   loaded into an overlay space located within the dynamic section, the overlay space to

8   have a fixed entry address; and

9   an external memory operably coupled to the integrated circuit to store the

10 functional programs and to transfer a particular functional program into the overlay space

11 when the main program performs a functional operation without identifying the particular

12 functional program

1   17.   The multi-function handheld device of claim 16, wherein the internal memory is a

2   random access memory and the external memory is a flash memory device.

1   18.   The multi-function handheld device of claim 16, wherein the external memory is

2   larger in capacity than the internal memory, but in which the functional programs are

3   loaded into the overlay space to allow overlay in use of the functional programs.

1   19.   The multi-function handheld device of claim 16, wherein the overlay space has a

2   fixed entry address so that an address to load functional programs need not be specified

3   in the preludes.

1 20.   The multi-function handheld device of claim 16, wherein the integrated circuit

2 includes a register for the preludes to load resource identifiers, which are to be used by a

3 calling routine to load the functional programs.